

SR 18: 180th Avenue SE to Maple Valley (Wetland KA)

USACE IP 1999-4-00171

Northwest Region

2006 MONITORING REPORT

Wetland Assessment and Monitoring Program

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Environmental Services Office

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SR 18: 180th Avenue SE to Maple Valley (Wetland KA)

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	General Site Information	
	USACE IP Number	1999-4-00171
	WSDOT Contract Name and Number	SR 18 180 th SE to Maple Valley, C6008
	Mitigation Location	SE corner SR 18 at the Jenkins Creek Bridge, King County
	Replanting Date	2003
	Initial Monitoring Period	2004-2013
	Year of Monitoring	3 of 10
	Area of Project Impact	0.14 acres (Wetland KA)
	Type of Mitigation	Wetland Restoration
	Area of Mitigation	0.14 acres

Summary of Monitoring Results and Management Activities

Performance Criterion	Results	Management Activities
Success Standards		
5a. Control priority noxious weeds	Weed control was completed in Fall 2005 and Spring 2006.	Continued weed control.
5b. < 25% cover by reed canarygrass	45-50% aerial cover	

Report Introduction

This report summarizes Year 3 monitoring activities at the State Route (SR) 18: 180th Avenue SE to Maple Valley (Wetland KA) mitigation site. Included is a description of the site, the success criteria, an explanation of how the site was monitored, an evaluation of site success, and a discussion of how it is developing. Monitoring activities documented in this report include 2005 vegetation surveys and photo-documentation. Appendix 3 contains the photos from the permanent photo points on site.

What is the SR 18 Wetland KA Mitigation Site?

The Wetland KA mitigation site consists of 0.14 acres of wetland restoration. This site was replanted after a group of trees in Wetland KA were inadvertently cut during project construction. The removal of these trees was an unintentional deviation from the project permit; the replanting and restoration of this site provides partial compensation for the violation. Additional compensation is provided at the SR 18 Kendal 2 mitigation site.

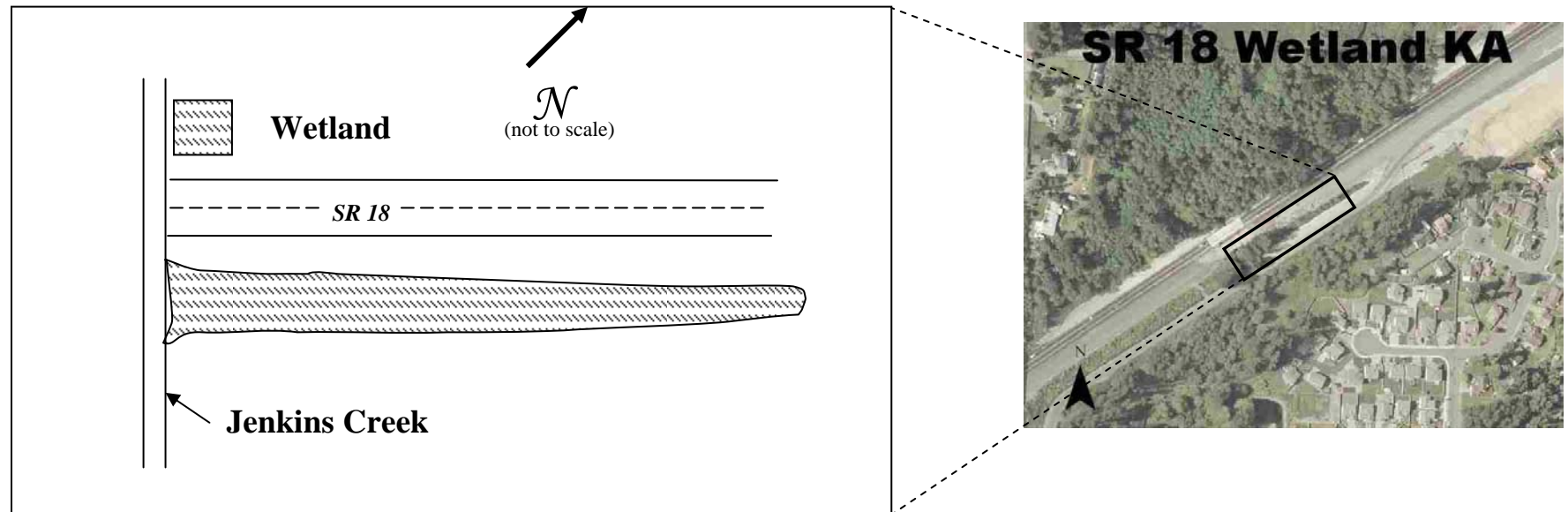


Figure 1 Site Sketch

The site is a replanted forested wetland adjacent to SR 18 in King County. Appendix 1 includes directions to the site.

What are the performance criteria for this site?

Permit Requirement 1

Describe the replanting success of the restoration of Wetland KA.

Permit Requirement 2

Each year's monitoring report shall include photographic documentation of the project taken from permanent reference points.

Performance Standard 5a

All King County-listed Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the mitigation site.

Performance Standard 5b

The enhancement and restoration areas shall contain no more than 25% areal (*sic*) cover by reed canarygrass at any point during the lifetime of the monitoring period.

Appendix 1 provides the complete text of the performance criteria for this project, and Appendix 4 shows the planting plan (Antieau and Krueger 2001).

How were the success standards measured?

Qualitative data were collected in 2005 to evaluate the third year performance standards and permit requirements. Replanting success was evaluated based on observations of plant size and aerial cover (Permit Requirement 1). Aerial cover of *Phalaris arundinacea* (reed canarygrass) and presence of King County listed noxious weed species were also assessed qualitatively (Performance Standards 5a and 5b).

Photographs were taken at permanent photo points to address Permit Requirement 2 (see Appendix 3).

For additional details on the methods, view the WSDOT Wetland Mitigation Site Monitoring Methods at:
<http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf>

How is the site re-developing?

The site is beginning to re-develop well. Woody species planted at Wetland KA are well established. Although aerial cover of *Phalaris arundinacea* (reed canarygrass) was above the permit requirement in 2005, subsequent aggressive weed control and replanting have occurred. With continued weed control, the forested wetland should develop as intended.

Results for Permit Requirement 1

(Describe the replanting success at Wetland KA):

Based on qualitative evaluation, *Thuja plicata* (western red cedar), *Populus balsamifera* (black cottonwood), *Fraxinus latifolia* (Oregon ash), and *Salix* species (willows) were well established in Summer 2005. Aerial cover provided by planted woody species was estimated to be 30%. Cover was greater closer to Jenkins Creek (on the southwest side of the site). With time, woody cover should approximate or exceed its pre-impact condition. If *Spiraea douglasii* (hardhack) and other naturalizing shrubs are included, woody cover is qualitatively estimated to be 45%.

Control of *Rubus laciniatus* (cutleaf blackberry), and *Rubus armeniacus* (Himalayan blackberry) appears to have improved replanting success in the wetland. In early 2006, additional *F. latifolia*, *Picea sitchensis* (Sitka spruce), and *Salix lucida* (Pacific willow) were planted to increase the density of woody species and to minimize proliferation of *P. arundinacea*.



Photo 1

Woody species re-establishment (August 2005).

Results for Performance Standard 5a

(All King County-listed Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the mitigation site):

Weed control activities have occurred annually, targeting noxious weeds and other potentially invasive species. These species (excluding *P. arundinacea*) provided a trace amount of cover.

Results for Performance Standard 5b

(Less than 25% cover by reed canarygrass in the at any point during the monitoring period):

In Summer 2005, *Phalaris arundinacea* (reed canarygrass) dominated the herbaceous layer with an estimated 45 to 50% aerial cover (Photo 2). A recovery plan was created to satisfy regulatory compliance. Focused weed control was intended to achieve the threshold. *Phalaris arundinacea* was mechanically cut and removed in the fall of 2005 before new plantings were installed. Following re-growth in spring 2006, *Phalaris arundinacea* will be sprayed. Another re-spray will follow in 6 to 8 weeks, and again as determined necessary.



Photo 2

***Phalaris arundinacea* in the wetland (August 2005).**

Appendix 1 - Success Standards

The following excerpt is from the *SR 18: 180th Ave SE to Maple Valley, Washington (MP 12.57 to MP 16.55) Final Wetland Mitigation Plan* (Antieau and Krueger 2001). The criteria addressed this year are identified in **bold** font. Other tasks and standards will be addressed in the indicated monitoring year.

Mitigation Goals

The Jenkins Creek wetland/floodplain complex provides important wetland and stream functions, and is a high quality system despite the surrounding levels of development. In the rapidly urbanizing Covington Sub-basin, the Jenkins Creek wetland system provides significant wildlife habitat, including habitat for migration/travel, escape, resting, forage, and reproduction. Jenkins Creek supports salmonid populations. Adjacent wetlands are integral to in-stream habitat, providing wintering habitat, water temperature moderation, inputs of detritus and woody debris, and escape cover.

While the Jenkins Creek system currently provides significant wildlife and fish habitat, the overall quality and quantity of functioning could be improved using restoration and enhancement of degraded wetland and stream areas in that system. The proposed compensatory mitigation for this project is intended to replace wetland types and wetland functions that will be lost due to project construction. Proposed mitigation is anticipated to mitigate loss of the following functions:

Fish and wildlife habitat: mitigation will increase available habitat for fish and wildlife, increase habitat and floodplain connectivity, and provide additional winter refugia for fish.

Food chain support: mitigation will increase available wildlife forage material and detrital input to Jenkins Creek.

Stream temperature moderation: mitigation will increase shade and canopy closure over the streams, while also enhancing potentials for recruiting large woody debris.

Flood water attenuation: mitigation will increase the floodplain area.

Nutrient/contaminant trapping: mitigation will provide an increased area of vegetated floodplain having opportunity to intercept and transform road-runoff contaminants, fertilizers, herbicides, and other pollutants from residential and agricultural activities upstream.

Aside from wetland preservation, a combination of creation, restoration, and enhancement activities will be used to obtain these benefits. Overall, these activities will attempt to achieve 5.71 acres of palustrine forested wetland and 0.20 acre of emergent wetland as mitigation for the loss of 0.81 acre of palustrine forested and emergent wetland.

Objectives and Performance Standards

Objective 1: Wetland Areal Extent and Wetland Hydrology

The wetland mitigation actions involving creation and restoration must demonstrate a total of 1.48 acres or more that support wetland hydrology (Table 4). Hydrology in zones of creation and restoration will be monitored in Monitoring Years One, **Two**, Three, Five, Seven, and Ten. Monitoring wells will be left in place to facilitate hydrologic data analysis during plant establishment.

Performance Standards: Monitoring Years One through Five

PS1. Creation and restoration areas must demonstrate a total of 1.48 acres or more that support wetland hydrology.

Monitoring/Delineation Schedule

A determination of areal extent will be made during the hydrology monitoring period using standard wetland delineation methodology using these monitoring data. The boundary and areal extent of the area supporting wetland hydrology will be determined using an instrument survey or other reliable method of determining area.

Potential Contingency Actions

Regrade the site to achieve the required acreage supporting hydroperiods that meet the hydrology criterion for wetlands (Environmental Laboratory 1987)- “hydrology criterion” inundation or saturation within 12 inches of the surface for 12.5% of the growing season March 1-October 31.

Objective 2: Vegetation

The mitigation program is intended to enhance 0.20 acre of emergent wetland (3 percent), enhance 4.23 acres of forested habitat (72 percent), and create and restore 1.48 acres of forested wetland (25 percent) (Table 3). Each of these habitats is expected to be dominated by native plant species. Wetland plant communities are expected to appear to be succeeding toward the intended forested and emergent communities.

Performance standards: Monitoring Year One (one year after planting)

PS2. At the end of the first growing season all planted material shall be alive and healthy (all dead material will be replaced). The enhancement and restoration areas shall contain no more than 25% areal cover by reed canarygrass at any point during the lifetime of the monitoring period.

Performance Standards: Monitoring Year Two and Three

PS3. Three years after planting, emergent wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 60% or more areal cover involving at least three non-invasive herbaceous plant species adapted for life in saturated soil conditions (facultative-wet or wetter). Forested wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 15% or more areal cover involving at least three species of woody plant species adapted for life in saturated soil conditions (facultative or wetter).

PS4. Three years after planting, upland buffer zones will be comprised of a planted and native naturally colonizing plant community with 15% or more areal cover involving at least three woody plant species.

PS5. All King County-listed Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the mitigation site.

Reed canarygrass (a King County Weed of Concern) is expected to be present during the life of this mitigation effort due to the abundant and adjacent source of propagules, as well as the presence of reed canarygrass on the mitigation site. **The enhancement and restoration areas shall contain no more than 25% areal cover by reed canarygrass at any point during the lifetime of the monitoring period.**

Performance Standards: Monitoring Year Five, Seven, and Ten

PS6. Five years after planting, emergent wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 75% or more areal cover involving at least three non-invasive herbaceous plant species adapted for life in saturated soil conditions (facultative-wet or wetter). Forested wetland mitigation areas will be comprised of a planted and native naturally colonizing plant community with 25% or more areal cover involving at least three species of woody plant species adapted for life in saturated soil conditions (facultative or wetter).

PS7. Five years after planting, the buffer will be comprised of a planted and native naturally colonizing plant community with 25% or more areal cover involving at least three woody plant species.

Monitoring Schedule

Once during the middle part of the growing season in Monitoring Years One, Two, Three, Five, Seven, And Ten.

Potential Contingency Actions

Before the beginning of Monitoring Year One, all dead or unhealthy plants will be replaced. Thus, monitoring 100% survival in Monitoring Year One (Performance Standards PS3) will be verifying this.

If the site does not meet performance standards PS4 and PS5 (Monitoring Year Three), additional planting will be conducted. Live, containerized plant material will be replanted and monitored to assure that coverage meets performance standards S6 and S7 (Monitoring Year Five).

If the site does not meet performance standards PS6 (vegetation not succeeding in directions that displace or weaken reed canarygrass), and PS7 and PS8 (Monitoring Year Five), resource agencies will be consulted for advice on further measures to remedy problems at the site. The monitoring schedule will be extended and such reasonable measures will be conducted as necessary to establish appropriate wetland vegetation. WSDOT will perform all reasonable measures considered necessary to establish and maintain a functioning wetland/buffer system that meets the goals and objectives of this monitoring plan.

The mitigation plan uses and promotes the growth of native vegetation. **King County Class A, B-designate, and County-selected priority noxious weed species will be controlled in the season they are first identified on the site. In the event that reed canarygrass in the enhancement and restoration areas exceeds 25% areal cover at any point during the monitoring period, a range of techniques will be employed to bring the area into compliance. These techniques include hand pulling and off-site disposal, hand-spraying or wiping with Rodeo, flaming, trampling (crushing), and/or mowing.**

Objective 3: Wildlife Habitat

Wildlife cover and forage availability for birds and small mammals should increase substantially. Addition of native plants, logs with rootwads, logs, log rolls, brush piles, and herpetofaunal hibernacula will increase habitat diversity and structure in newly revegetated areas. Generally, the creation, restoration, enhancement, and preservation of forested and emergent wetland habitats are intended to provide feeding, breeding, and resting habitat for birds, small mammals, amphibians, and reptiles. Such activity will also benefit fish in Jenkins Creek and its tributary by reducing water temperatures and contributing detrital and woody debris.

Performance Standards: Monitoring Year One (one year after planting)

PS8. All habitat structures identified on the plan have been placed on the site.

Performance Standards: Monitoring Year Two and Three

PS9. Habitat structures identified in the plans are still in place and functional.

Performance Standards: Monitoring Year Five, Seven, and Ten
None.

Monitoring Schedule

Once during Monitoring Years One, Two, and Three.

Potential Contingency Actions

Install or replace habitat structures that are missing, damaged, lost, or non-functional.

MONITORING PLAN

WSDOT's Wetland Mitigation Monitoring Program (Monitoring Program) uses objective-based monitoring to document success and change in WSDOT's wetland mitigation sites. Monitoring protocols are based on specific objectives written in each project's wetland mitigation plan, combined with evaluation of current site conditions. A customized monitoring program is developed for each site. The Monitoring Program uses a variety of ecological monitoring techniques and protocols, including those outlined in Horner and Raedeke (1989) and in WSDOT (2000b). Many standard techniques such as permanent transect lines, plots, and photo points are still used. However, the number and placement of those depend on specific site objectives. Locations of photopoints and transects, if used, are not selected until the first year of monitoring. Statistical precision and accuracy are used to determine the number and configuration of transects and sample plots.

The Monitoring Program will begin monitoring hydroperiod in the wetland creation portion of the site immediately after completion of the grading plan, but prior to construction of the planting plan. During this period, hydrology will be monitored at least twice monthly using shallow groundwater wells or other means of observing soil saturation/inundation. After the planting plan has been constructed, Monitoring Year One will commence at the start of the subsequent year. Beginning with the first growing season after construction of the planning plan, the Monitoring Program will monitor the mitigation site for at least ten years. Parameters to be monitored during this ten-year period include hydroperiod and vegetation, as described above.

Reports for the ten-year monitoring period (including a report for each Monitoring Years One, Two, Three, Five, Seven, and Ten) will be issued to the Corps of Engineers Seattle District Regulatory Branch, Washington State Department of Ecology, King County Department of Development and Environmental Services, and other appropriate resource agencies for review and comment. Successful mitigation will be measured by attainment of the performance standards described in this mitigation plan document. Monitoring may be curtailed early or reduced in intensity if the mitigation effort meets the stated performance standards earlier than anticipated.

CONTINGENCY ACTIONS

WSDOT anticipates the mitigation goal will be achieved by accurately completing the grading and planting plans. However, contingency actions, as described above, may be needed to correct unforeseen problems. Such actions may consist of regarding the site in the case of insufficient hydroperiod, or replanting the site in the case of planting failure. However, natural recruitment of native wetland species and upland species (in the buffer) will be counted toward achieving performance standards for Vegetation. Should areal coverage of wetland or buffer plants consistently fall short of desired performance standards, WSDOT will consult with appropriate agencies in determining what additional measures could be implemented to ensure establishment of viable wetland and upland plant communities.

Appendix 2 - Permit Requirement

From USACE Regulatory Branch Letter (2002, p.3) (Permit1999-4-00171)

The criterion is identified in **bold** font.

Because this project involves a permit deviation, you must submit annual wetland mitigation monitoring reports for the original and addendum mitigation plan to our office in a separate report than all other Washington State Department of Transportation (WSDOT) wetland mitigation annual monitoring reports. **The monitoring reports you submit for this project must also describe the replanting success of the restoration of wetland KA**

Appendix 3 –ECY Permit 1999-4-00171

From Ecology Water Quality and Certification Permit 1999-4-00171 (2000, p. 7)

The Applicant shall prepare and submit annual monitoring reports to Ecology's Sarah Suggs and Sandra Manning, P.O. Box 47600, Olympia, WA 98504-7600 no later than December 30th of each year following the first year of project completion. **Each year's monitoring report shall include photographic documentation of the project taken from permanent reference points (Figure 4C.1).**

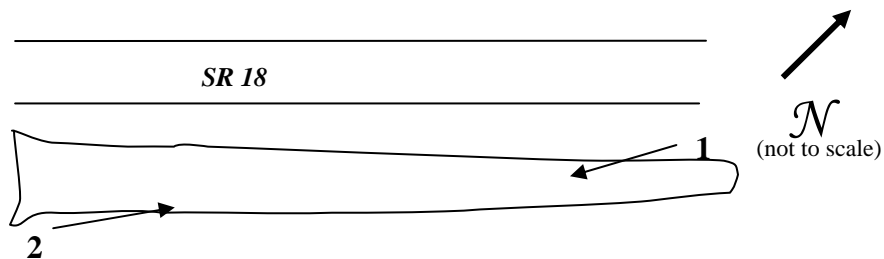


Figure 3.1 SR 18 Wetland KA Site Sketch with Photo Point Locations (April 2005)



Photo Point 1 – Wetland KA (April 2005)



Photo Point 2 – Wetland KA (April 2005)

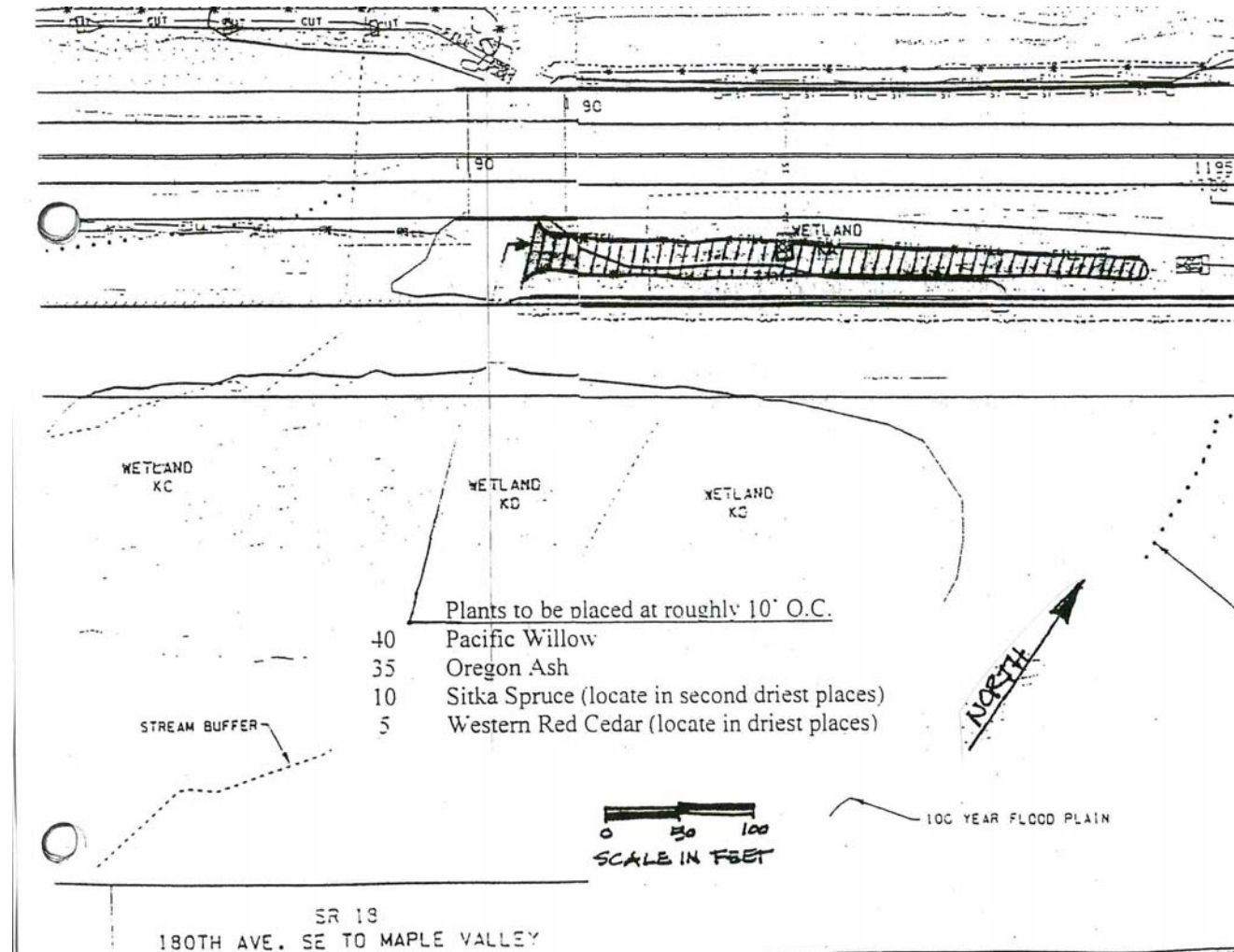
Appendix 4 - Data Tables

Table 1 Native Woody Species Observed in the Forested Wetland in 2005

Scientific Name	Common Name	Wetland Indicator Status
<i>Alnus rubra</i>	red alder	FAC
<i>Populus balsamifera</i>	black cottonwood	FAC
<i>Spiraea douglasii</i>	hardhack	FACW
<i>Picea sitchensis</i>	Sitka spruce	FAC
<i>Fraxinus latifolia</i>	Oregon ash	FACW
<i>Salix lucida</i>	Pacific willow	FACW+
<i>Cornus sericea</i>	redosier dogwood	FACW
<i>Polystichum munitum</i>	western swordfern	FACU
<i>Rubus spectabilis</i>	salmonberry	FAC+
<i>Crataegus douglasii</i>	black hawthorne	FAC
<i>Acer circinatum</i>	vine maple	FAC-
<i>Thuja plicata</i>	western red cedar	FAC
<i>Pseudotsuga menziesii</i>	Douglas-fir	FACU

Appendix 5 – Planting Plan

(Cleveland 2003)



Literature Cited

1. Cleveland, C. 2003. SR 18 – 180th to Maple Valley Wetland KA Background and Directions. Letter to Jodie Beall dated 24 April 2003.
2. Antieau, C. J. and Krueger, P. W. 2001. Final Wetland Mitigation Plan SR 18: Ave SE to Maple Valley, Washington (MP 12.57 to MP 16.55). Washington State Department of Transportation, Northwest Region, Seattle, WA.
3. Brown, B. 2002. SR 18: 180th Ave SE to Maple Valley, Washington, Updated Wetland Mitigation Plan Addendum. Washington State Department of Transportation, Northwest Region, Seattle, WA.
4. Ecology (see Washington State Department of Ecology)
5. Washington State Department of Ecology. 2000. Water Quality Certification Permit 1999-4-00171. Olympia, WA.
6. Washington State Department of Transportation (WSDOT). 2005. WSDOT Wetland Mitigation Site Monitoring Methods (25 May 2005). <http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf>
7. United States Army Corps of Engineers. September 6, 2002. Regulatory Branch Letter (Permit: 1999-4-00171).